



In the Claims:

Please cancel claims 3-7, 10-12, 15-19 and 22-24.

Please amend claims 1, 2, 8, 9, 13, 14, 20 and 21 as set forth below in the "Listing of Claims".

Please add new claims 25-32 as set forth in the "Listing of Claims" below.

LISTING OF CLAIMS

Claim 1 (Currently Amended): A method of forming a polar liquid film on a surface of an organic film formed on a substrate in a processing vessel, said method comprising:

a modifying step of curing the organic film and imparting an affinity for the polar liquid to the organic film by irradiating the organic film with electron beams by means of an electron-beam irradiation device in a rare gas atmosphere formed in the processing vessel; and

an applying step of applying the polar liquid to the surface of the organic film processed by the modifying step,

said modifying step comprising the sub-steps of:

curing the organic film by irradiating the organic film with the electron beams in the rare gas atmosphere of a first pressure in the processing vessel; and

imparting the affinity for the polar liquid to the organic film by irradiating the organic film with the electron beams in the rare gas atmosphere of a second pressure higher than the first pressure in the processing vessel.

Claim 2 (Currently Amended): The method according to claim 1, wherein the modifying step uses the rare gas atmosphere of a first pressure is below of 1 torr or above and the second pressure is 1 torr or above.

Claims 3-7 (Canceled)

Claim 8 (Currently Amended): The method according to claim 7 1, wherein the voltage applied to the electron-beam irradiation device is changed from comprises:

a first voltage to at the sub-step of curing the organic film, and  
a second voltage lower than the first voltage at the sub-step of imparting the  
affinity.

Claim 9 (Currently Amended): The method according to claim 8, wherein the first voltage is above 20 kV and the second voltage is 20 kV or below.

Claims 10-12 (Canceled)

Claim 13 (Currently Amended): A method of forming an inorganic film on a surface of an organic film formed on a substrate in a processing vessel, said method comprising:

a modifying step of curing the organic film and imparting an affinity for the inorganic film to the organic film by irradiating the organic film with electron beams by means of an electron-beam irradiation device in a rare gas atmosphere formed in the processing vessel; and

an a film forming step of forming the inorganic film on the surface of the organic film processed by the modifying step,

said modifying step comprising the sub-steps of:

curing the organic film by irradiating the organic film with the electron beams in the rare gas atmosphere of a first pressure in the processing vessel; and  
imparting the affinity for the inorganic film to the organic film by irradiating the organic film with the electron beams in the rare gas atmosphere of a second pressure higher than the first pressure in the processing vessel.

Claim 14 (Currently Amended): The method according to claim 13, wherein the modifying step uses the rare gas atmosphere of a first pressure is below 1 torr and the second pressure is of 1 torr or above.

Claims 15-19 (Canceled)

Claim 20 (Currently Amended): The method according to claim 19 13, wherein the voltage applied to the electron-beam irradiation device is comprises:

~~changed from a first voltage at the sub-step of curing the organic film, and to a second voltage lower than the first voltage at the sub-step of imparting the affinity.~~

Claim 21 (Currently Amended): The method according to claim 20, wherein the first voltage is above 20 kV and the second voltage is 20 kV or below.

Claims 22-24 (Canceled)

Claim 25 (New): The method according to claim 1, wherein the sub-step of imparting the affinity is carried out with the second pressure of 2 to 10 torr while heating the substrate at 200°C to 400°C.

Claim 26 (New): A method of forming a polar liquid film on a surface of an organic film formed on a substrate in a processing vessel, said method comprising:

a modifying step of curing the organic film and imparting an affinity for the polar liquid to the organic film by irradiating the organic film with electron beams by means of an electron-beam irradiation device in a rare gas atmosphere formed in the processing vessel; and

an applying step of applying the polar liquid to the surface of the organic film processed by the modifying step,

said modifying step comprising the sub-steps of:

curing the organic film entirely by irradiating the organic film with the electron beams with a first voltage applied to the electron-beam irradiation device, in the rare gas atmosphere of a first pressure in the processing vessel;

further curing a surface of the organic film by irradiating the organic film with the electron beams with a second voltage lower than the first voltage applied to the electron-beam irradiation device, in the rare gas atmosphere of the first pressure in the processing vessel; and

imparting the affinity for the polar liquid to the organic film by irradiating the organic film with the electron beams with the second voltage applied to the electron-beam irradiation device, in the rare gas atmosphere of a second pressure higher than the first pressure in the processing vessel.

Claim 27 (New): The method according to claim 26, wherein the first pressure is below 1 torr and the second pressure is 1 torr or above.

Claim 28 (New): The method according to claim 26, wherein the first voltage is above 20 kV and the second voltage is 20 kV or below.

Claim 29 (New): The method according to claim 13, wherein the sub-step of imparting the affinity is carried out with the second pressure of 2 to 10 torr while heating the substrate at 200°C to 400°C.

Claim 30 (New): A method of forming an inorganic film on a surface of an organic film formed on a substrate in a processing vessel, said method comprising:

a modifying step of curing the organic film and imparting an affinity for the inorganic film to the organic film by irradiating the organic film with electron beams by means of an electron-beam irradiation device in a rare gas atmosphere formed in the processing vessel; and

a film forming step of forming the inorganic film on the surface of the organic film processed by the modifying step,

said modifying step comprising the sub-steps of:

curing the organic film entirely by irradiating the organic film with the electron beams with a first voltage applied to the electron-beam irradiation device, in the rare gas atmosphere of a first pressure in the processing vessel;

further curing a surface of the organic film by irradiating the organic film with the electron beams with a second voltage lower than the first voltage applied to the electron-beam irradiation device, in the rare gas atmosphere of the first pressure in the processing vessel; and

imparting the affinity for the inorganic film to the organic film by irradiating the organic film with the electron beams with the second voltage applied to the electron-beam irradiation device, in the rare gas atmosphere of a second pressure higher than the first pressure in the processing vessel.

Claim 31 (New): The method according to claim 30, wherein the first pressure is below 1 torr and the second pressure is 1 torr or above.

Claim 32 (New): The method according to claim 30, wherein the first voltage is above 20 kV and the second voltage is 20 kV or below.